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Patrick S. Yoder
FLETCHER YODER
P.O. Box 692289
Houston, TX 77269-2289

EXAMINER	
ABDI, AMARA	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/723,791	LAL ET AL.	
	Examiner	Art Unit	
	Amara Abdi	2624	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 November 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description:

- References characters **86**,**90**, and **94** in **figure 4** were not mentioned in the specification.
- References characters **116**,**120**, and **122** in **figure 6** were not mentioned in the specification.

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claims 2,9-10, and 18 are objected to because of the following informalities:

(1) Claim 2, line 12, "**in** a Nyquist" should be changed to "**is** a Nyquist"; the same informality was found in **claim 13**, line 21.

(2) Claim 9, line 9, "**an** image" should be changed to "**the** image";

(3) Claim 10, line 12, "**a** redundancy" should be changed to "**the** redundancy"; the same informality was found in claim **18**, line 13.

Appropriate correction is required.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. The claimed invention is directed to non-statutory subject matter. Claims 25-26 are rejected. " a computer program" should be "a computer readable medium storing a computer program" in order to be a statutory subject matter.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1,3,5-10,14,16-18, and 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okada et al. (US 2004/0032990) in view of Avinash (US 5,943,433).

(1) Regarding claims 1,23, and 25:

Okada et al. disclose a method (paragraph [0028], line 2), system (paragraph [0073], line 9-10), and computer program (paragraph [0091], line 1-4) for producing an image data (paragraph [0023], line 1-3) comprising:

determining a pixel sampling rate for the image data (paragraph [0053], line 1-8; and paragraph [0057], line 1-4);

comparing the pixel sampling rate to a desired sampling rate (paragraph [0038], line 7-8), (the examiner interpreted the desired sampling rate as the conventional device);

However, Okada et al. does not disclose the determining of a shrink parameter based upon the comparison; and processing the image data, including shrinking an input image based upon the shrink parameter as recited in claims 1,23, and 25.

Avinash teaches a method for correcting inhomogenety of spatial intensity in an acquired MR image, where determining a shrink parameter (column 5, line 19-20; and column 6, line 21-24) and comparing the intensity of respective pixel with the threshold T (column 5, line 52-53), (the examiner interpreted the comparing the comparing of the intensity of respective pixels with the threshold as the same concept as comparing the pixel sampling rate to the desired sampling rate); and processing the image data, by

applying a shrink operation to the matrix array of pixels to provide a shrink function (column 5, line 43-46).

One of ordinary skill in the art would have clearly recognized the determining of a shrink parameter (column 6, line 21-24) based upon the comparison (column 5, line 50-52); and processing the image data, including shrinking an input image based upon the shrink parameter (column 5, line 14-18; and column 5, line 43-46). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to combine the system of Avinash, where determining a shrink parameter and shrinking the input image, in the system of Okada et al., because such feature can produce magnetic resonance (MR) images with greater accuracy than certain prior art correction techniques, and yet requires only one fifth of the imaging time (column 3, line 61-63).

(2) Regarding claims 3 and 14:

Okada et al. further disclose the method, where the desired sampling rate is determined based on the frequency content of the image data (paragraph [0069], line 3-11).

(3) Regarding claims 5,10, and 18:

Okada et al. disclose all the subject matter as described in claim 1 above.

However, Okada et al. does not disclose the method and system, where the shrink parameter is a ratio of the pixel-sampling rate to the desired sampling rate when the redundancy metric is below a predetermined threshold as recited in claims 5 and 10.

Avinash teaches a method for correcting inhomogenety of spatial intensity in an acquired MR image, where the first function representing the filtered shrunk function is

divided by a second function representing the filtered threshold function to produce a shrunk form distortion function (column 3, line 19-22), (the examiner interpreted the ratio of the pixel sampling rate to the desired sampling rate as the same concept as the ratio of the first function to the second function to produce a shrunk function), when the redundancy metric is below a predetermined threshold (column 5, line 50-53), (the examiner interpreted the redundancy metric as the intensity of pixels which are compared to the threshold).

One of ordinary skill in the art would have clearly recognized the method, where the shrink parameter is a ratio of the first function which representing the filtered shrink function to the second function which representing the filtered threshold function to produce a shrink function (column 3, line 16-22), when the redundancy metric is below a predetermined threshold (column 5, line 50-53). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to combine the system of Avinash, where the shrink parameter is the ratio of the first function to the second function, in the system of Okada et al., because such feature provides a method, where speed of computation is substantially improved by using reduced data sets, without compromising the accuracy of the final result (column 4, line 5-8).

(4) Regarding claim 6:

Okada et al. disclose all the subject matter as described in claim 5 above.

However, Okada et al. does not disclose the method, where the redundancy metric is a ratio of the pixel-sampling rate to the desired sampling rate when the redundancy metric is below a predetermined threshold as recited in claim 6.

Avinash teaches a method for correcting inhomogenety of spatial intensity in an acquired MR image, where the first function representing the filtered shrunk function is divided by a second function representing the filtered threshold function to produce a shrunk (the redundancy metric) form distortion function (column 3, line 19-22), (the examiner interpreted the ratio of the pixel sampling rate to the desired sampling rate as the same concept as the ratio of the first function to the second function to produce a redundancy metric).

One of ordinary skill in the art would have clearly recognized the method, where the shrink parameter is a ratio of the first function which representing the filtered shrink function to the second function which representing the filtered threshold function to produce a shrink function (column 3, line 16-22). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to combine the system of Avinash, where the redundancy metric is the ratio of the first function to the second function, in the system of Okada et al., because such feature provides a method, where speed of computation is substantially improved by using reduced data sets, without compromising the accuracy of the final result (column 4, line 5-8).

(5) Regarding claim 7:

Okada et al. disclose all the subject matter as described in claim 6 above.

However, Okada et al. does not disclose the method, where the threshold is unity as recited in claim 7.

Avinash teaches a method for correcting inhomogenety of spatial intensity in an acquired MR image, where the threshold is define by: T=T1 Max [g], where T1 is usually

selected to be 0.025 (column 5, line 48-49), (the examiner interpreted the threshold function as a definite amount).

One of ordinary skill in the art would have clearly recognized the method, where the threshold is unity (column 5, line 43-49). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to combine the system of Avinash, where the threshold is unity, in the system of Okada et al., because such feature provides a method, where speed of computation is substantially improved by using reduced data sets, without compromising the accuracy of the final result (column 4, line 5-8).

(6) Regarding claims 8,24, and 26:

Okada et al. disclose a method (paragraph [0028], line 2), system (paragraph [0073], line 9-10), and computer program (paragraph [0091], line 1-4) for producing an image from image data (paragraph [0023], line 1-3) comprising:

determining a desired sampling rate for the image data (paragraph [0071], line 2-6), (the examiner interpreted the desired sampling rate as the conventional system);

determining a pixel sampling rate for the image data (paragraph [0053], line 1-8; and paragraph [0057], line 1-4); and

comparing the pixel sampling rate to the desired sampling rate (paragraph [0038], line 7-8),

However, Okada et al. does not disclose the determining of the redundancy metric; and processing the image data upon the redundancy metric as recited in claims 8,24, and 26.

Avinash teaches a method for correcting inhomogenety of spatial intensity in an acquired MR image, where determining the redundancy metric (column 3, line 40-42) (the examiner interpreted the redundancy metric as the intensity of pixels); and processing the image data upon the determining redundancy (column 5, line 43-46).

One of ordinary skill in the art would have clearly recognized the method, where the redundancy is determined (column 3, line 40-43), and processing the image data upon the determining of the redundancy (column 5, line 14-18; and column 5, line 43-46). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to combine the system of Avinash, where determining the redundancy metric; in the system of Okada et al., because such feature can produce magnetic resonance (MR) images with greater accuracy than certain prior art correction techniques, and yet requires only one fifth of the imaging time (column 3, line 61-63).

(7) Regarding claims 9 and 17:

Okada et al. disclose all the subject matter as described in claim 8 above.

However, Okada et al. does not disclose the method, where the image data is processed by shrinking an image defined by the data by a shrink parameter based upon the redundancy metric as recited in claims 9 and 17.

Avinash teaches a method for correcting inhomogenety of spatial intensity in an acquired MR image, where the image data is processed by shrinking an image defined by the data (column 5, line 43-46) by a shrink parameter (column 5, line 19-20) based upon the redundancy metric (column 3, line 40-42), (the examiner interpreted the redundancy metric as the intensity of the pixels).

One of ordinary skill in the art would have clearly recognized the method, where the image data is processed by shrinking an image (column 5, line 43-46) defined by the data by a shrink parameter (column 6, line 21-24) based upon the redundancy metric (column 3, line 40-42. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to combine the system of Avinash, where the image data is processed by shrinking an image, in the system of Okada et al., because such feature provides a method, where the speed of computation is substantially improved by using reduced data sets, without compromising the accuracy of the final result (column 4, line 5-8).

(8) Regarding claim 16:

Okada et al. disclose the system (paragraph [0073], line 10) for processing image data (paragraph [0023], line 1-3), the system comprising:

a memory circuit for storing image data (paragraph [0091], line 1-4), (the examiner interpreted that the storing of the image data in the computer means the storing the image data in the circuit memory, the fact that the circuit memory is part of the computer); and

a processing circuit for accessing the image data (paragraph [0024], line 1-5),

determining a desired sampling rate for the image data (paragraph [0071], line 2-6), (the examiner interpreted the desired sampling rate as the conventional system);

determining a pixel sampling rate for the image data (paragraph [0053], line 1-8; and paragraph [0057], line 1-4), and

comparing the pixel sampling rate to the desired sampling rate (paragraph [0038], line 7-8),

However, Okada et al. does not disclose the determining of the redundancy metric, and processing the image data based upon the redundancy metric as recited in claim 16.

Avinash teaches a method for correcting inhomogenety of spatial intensity in an acquired MR image, where determining the redundancy metric (column 3, line 40-42) (the examiner interpreted the redundancy metric as the intensity of pixels); and processing the image data based upon the redundancy metric (column 5, line 14-18; and column 5, line 43-46).

One of ordinary skill in the art would have clearly recognized the method, where determining the redundancy metric (column 3, line 40-43), and processing the image data based upon the determining of redundancy metric (column 5, line 14-18; and column 5, line 43-46). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to combine the system of Avinash, where determining the redundancy metric; in the system of Okada et al., because such feature can produce magnetic resonance (MR) images with greater accuracy than certain prior art correction techniques, and yet requires only one fifth of the imaging time (column 3, line 61-63).

7. Claims 2 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okada et al., and Avinash, as applied to claim 1 above, and further in view of Tufts (US 5,253,192).

Okada et al. and Avinash disclose all the subject matter as described in claim 1 above.

However, Okada et al. and Avinash do not disclose the method, where the desired sampling rate is a Nyquist rate of sampling for the image as recited in claims 2 and 13.

Tufts teaches a signal processing apparatus and method for iteratively determining arithmetic Fourier transform, where the function to be analyze can be sampled uniformly and at a rate close to the Nyquist rate (column 42, line 21-24).

One of ordinary skill in the art would have clearly recognized the method, where the desired sampling rate is a Nyquist rate of sampling for the image (column 42, line 19-24). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to combine the system of Tufts, where the desired sampling rate is a Nyquist rate, in the system of Okada et al., because such feature is using the Arithmetic Fourier Transform (AFT), which is an algorithm for accurate high speed Fourier analysis and narrow-band filtering (column 1, line 10-12). The arithmetic computation of this iterative AFT has a high degree of parallelism and the resulting architecture is regular. Because of its simplicity it could be of interest in many application such as phase retrieval, two dimensional maximum entropy power spectral estimation and recursive digital filter design, where many Fourier transform and inverse Fourier transform calculation are required (column 2, line 13).

8. Claims 4 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okada et al., and Avinash, as applied to claims 1 and 8 above, and further in view Finger et al. (US 6,015,385).

Okada et al., and Avinash disclose all the subject matter as described in claims 1 and 8 above.

However, Okada et al., and Avinash do not disclose the method, where the pixel sampling rate is determined based upon a display field of view, and a size of pixels in the filed of view as recited in claims 4 and 15.

Finger et al. teaches an ultrasonic diagnostic imaging system with programmable acoustic signal processor, where the pixel-sampling rate is determined based on a display and a size of pixel (column 12, line 22-28).

One of ordinary skill in the art would have clearly recognized the method, where the sampling rate is determined based on the display and the size of the pixel (column 12, line 22-32). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to combine the system of Finger et al., where the sampling rate is determined upon determining the display and the size of pixel, in the system of Okada et al., because such feature is directed to an improved system that reduces image artifacts and maximizes the amount of information in a display image, for both full size and enlarged images (column 1, line 18-21).

9. Claims11-12 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okada et al., and Avinash, as applied to claims 8 and 16 above, and further in view Blackham et al. (US PG-PUB 2002/0130875).

(1) Regarding claims 11 and 19:

Okada et al., and Avinash disclose all the subject matter as described in claim 8 and 16 above.

However, Okada et al., and Avinash do not disclose the method, where the image data is processed by resampling the image data as recited in claims 11 and 19.

Blackham et al. teaches an image display apparatus, where the image data is processed by resampling the image data into a small pixels by using of a standard interpolation method (paragraph [0023], line 4-8).

One of ordinary skill in the art would have clearly recognized the method, where the image data is processed by resampling the image data (paragraph [0023], line 1-9). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to combine the system of Blackham et al., where the image data is processed by resampling the image data, in the system of Okada et al., because such feature provides a uniform high resolution capability, in which low resolution wide filed of view and high resolution narrow filed of view are able to be electronically processed into a common high resolution pixels format and blended before being display by very high resolution display apparatus (paragraph [0007], line 2-7).

(2) Regarding claims 12 and 20:

Okada et al. further disclose the method (paragraph [0028], line 2), system (paragraph [0073], line 9-10), where the image data is resampled to much the desired sampling rate (paragraph [0038], line 7-8), (the examiner interpreted that the resampled method as the same concept as the sampling method, and the examiner interpreted also the term matching in the claim has the same concept as the term comparing).

10. Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okada et al., and Avinash, as applied to claim 16 above, and further in view Delestienne et al. (US 6,377,162).

(1) Regarding claim 21:

Okada et al., and Avinash disclose all the subject matter as described in claim 16 above.

However, Okada et al., and Avinash do not disclose that the system further comprising a data acquisition system as recited in claim 21.

Delestienne et al. teaches a medical diagnostic field service method and apparatus, where the scanner (the imaging device) is coupled to a generator and a controller as well as a signal acquisition unit (column 5, line 46-47), (the examiner interpreted the signal acquisition unit as the data acquisition system).

One of ordinary skill in the art would have clearly recognized the system, which comprises the data acquisition system (column 5, line 46-51). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to combine the system of Delestienne et al., where the system comprises the data acquisition system,

in the system of Okada et al., because such feature permits interactive exchange of information, such as service request and data, between diagnostic systems, remote or centralized field services facilities, and field service units (column 3, line 1-3).

(2) Regarding claim 22:

Okada et al., and Avinash disclose all the subject matter as described in claim 21 above.

However, Okada et al., and Avinash do not disclose the system, where the data acquisition system is selected from a group consisting of a CT system, an MRI system, an ultrasound system, an X-ray system, a tomosynthesis system, and PET system as recited in claim 22.

Delestienne et al. teaches a medical diagnostic field service method and apparatus, where the circuitry within the controlled and signal acquisition components are coupled to the system controller (column 5, line 51-55), and the system controller is linked to a communication module generally similar to communication module of MRI system (column 5, line 56-59).

One of ordinary skill in the art would have clearly recognized the system, where the data acquisition system is selected from an MRI system (column 5, line 51-59). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to combine the system of Delestienne et al., where the data acquisition system is selected from MRI system, in the system of Okada et al., because such feature permits interactive exchange of information, such as service request and data,

between diagnostic systems, remote or centralized field services facilities, and field service units (column 3, line 1-3).

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Freundlich et al. (US 6,178,220) disclose a CT system with oblique image planes.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amara Abdi whose telephone number is (571) 270-1670. The examiner can normally be reached on Monday through Friday 7:30 Am to 5:00 PM E.T..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wu Jingge can be reached on (571) 272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Amara Abdi
05/23/2007

JINGGE WU
SUPERVISORY PATENT EXAMINER